

Agile Methods and Process Maturity

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Different Goals

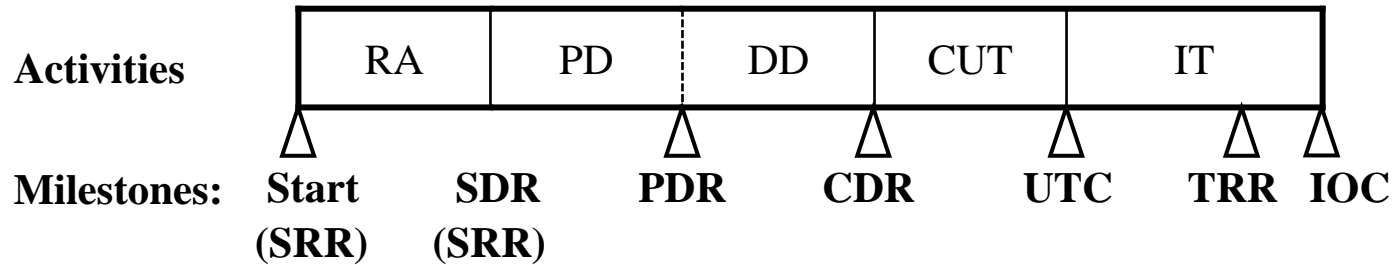
- **Disciplined Methods (CMMI processes)**
 - **Consistency**
 - **Stability**
 - **Predictability**
- **Agile Methods**
 - **Respond to rapid change**
 - **Promotes innovation**
 - **“WYSIWYG”**

Comparison of Characteristics

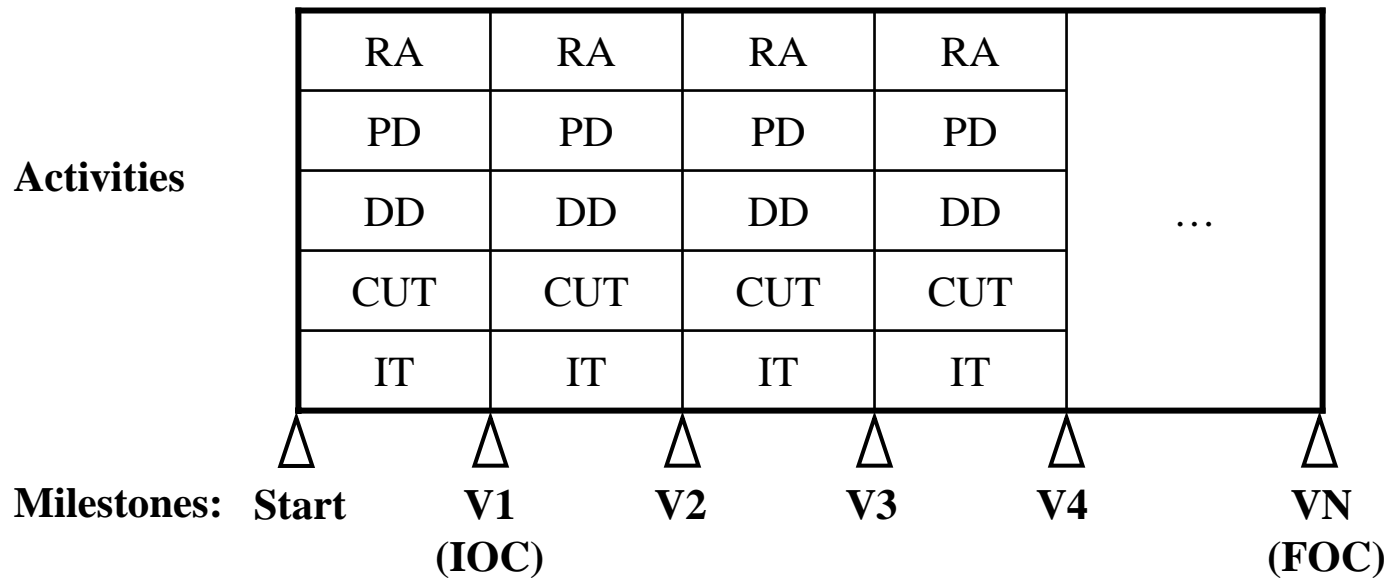
Area	Characteristic	Disciplined	Agile
Product	Requirements Specifications Emphasis for “Acceptability” Deliveries Operational Life	Knowable and stable Formal document(s) High assurance (risk adverse) One or a few Multiple years or decades	Unprecedented and emergent Prioritized list of features Rapid capability (fast benefit) Often (monthly or less) One year or less
Process	Definition of activities Cost of rework Control Customer Liaison Plan revisions	Explicit documents and plans Increases with time Quantitative, directed Periodic reviews (fire and forget) Yearly (quarterly)	Informal plans Remains fairly constant Qualitative, consensus Collocated with development team Weekly (daily)
People	Team Size	Few to hundreds	Less than 35
Project	Constraints Contract Types	Functions, Cost, Schedule, and Quality FFP, Cost Plus	Cost or Schedule, Quality, Functions T&M, Cost Plus

Comparison of Activities

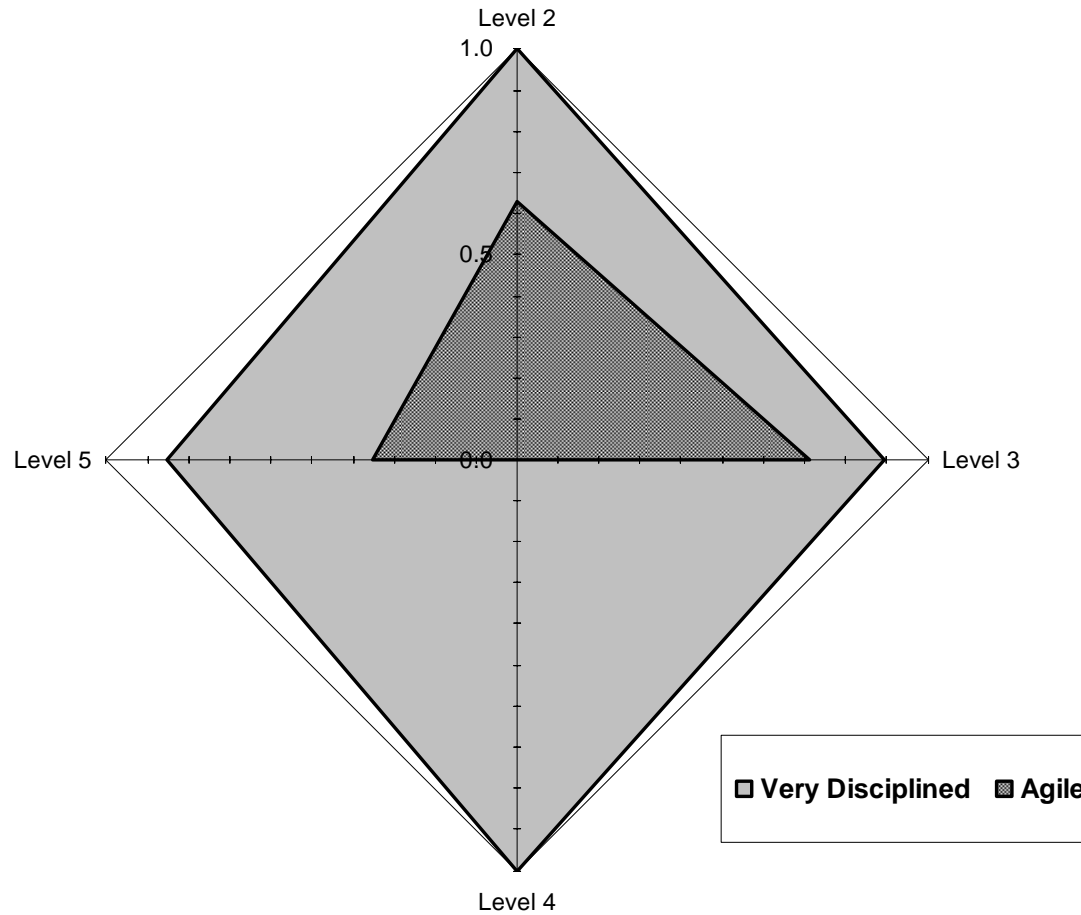
Waterfall



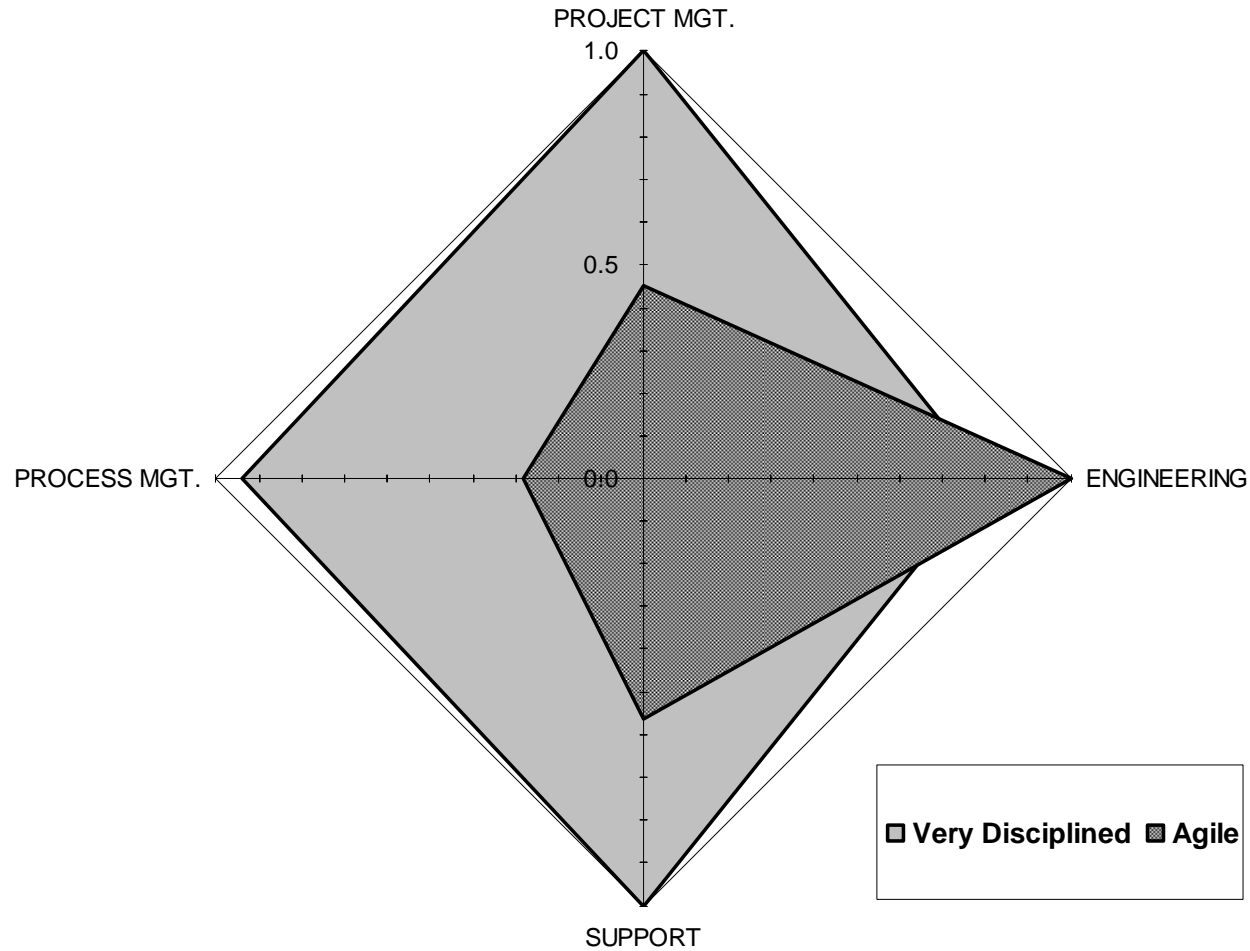
Agile



Comparison by CMMI Level



Comparison by CMMI Discipline



□ Very Disciplined ■ Agile

Our Changing World*

The Past	The Future (Now?)
Standalone systems	Highly interconnected systems
Stable requirements	Rapidly changing requirements
Requirements drive custom, “complete” solution	COTS capabilities drive affordable, “adequate” solution
Buyer controls product evolution	Vendor controls COTS evolution
Enough time to keep stable	Ever-decreasing cycle times
Repeatable process (maturity models)	Adaptive process models

*Based on a presentation by Barry Boehm on 11/13/2002.

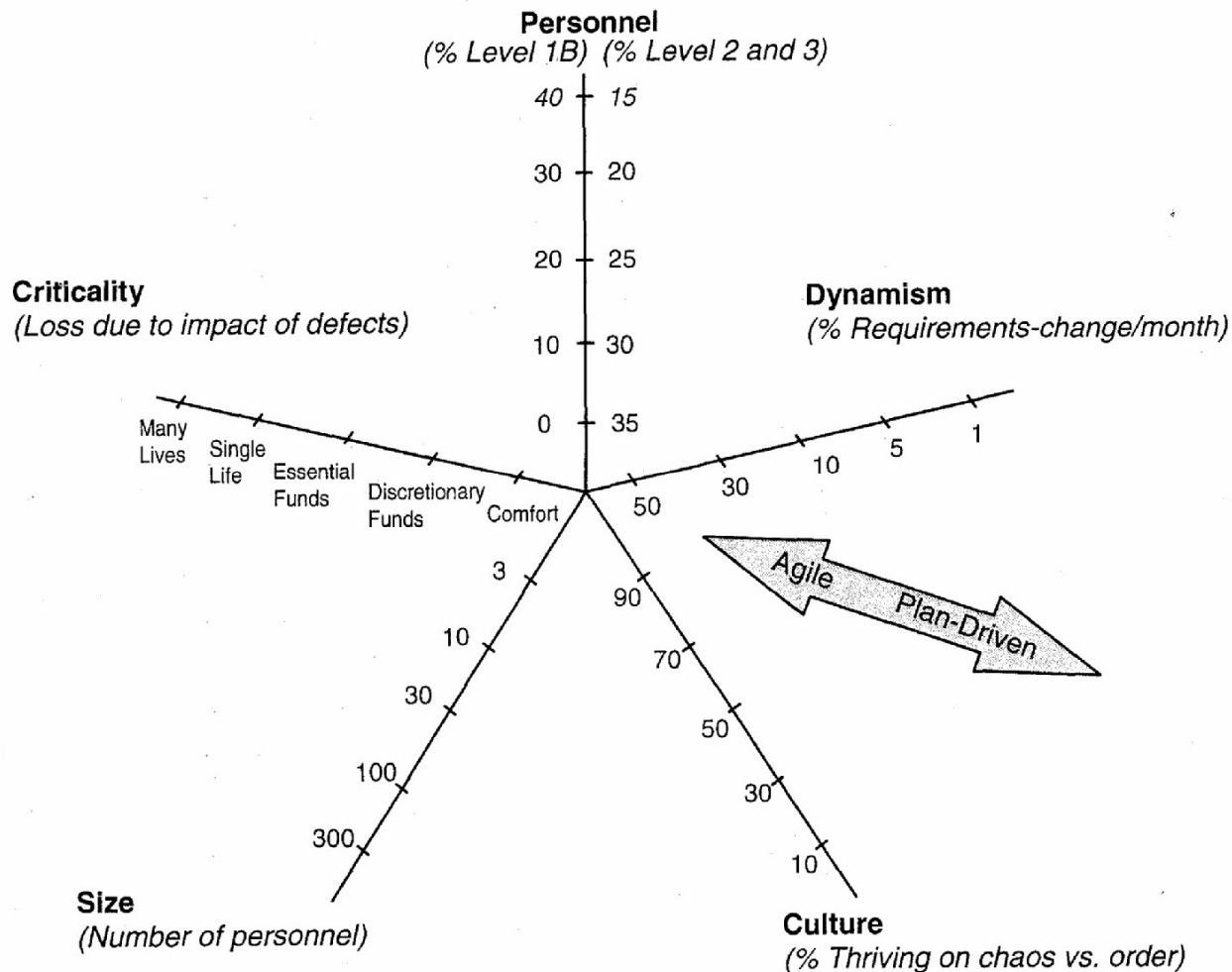
CMMI Supports Agility

- **All stakeholders collaborate on requirements (RD/SG1, IPM/SG2)**
- **Recursion of engineering PAs (e.g. RD, TS)**
- **Product Integration PA can support continuous integration**
- **Engineering and Support PAs (e.g. VAL, CM) are compatible with test-driven design and automated tools**
- **Alternative practices provide an entry point for innovative approaches**
- **Scope allows multiple disciplines and approaches for different components**

The Need for Balance

- **Project success requires both agility and discipline**
 - Different parts of a project can use different approaches
 - Agile for emerging or rapidly evolving components
 - Plan-driven for well-understood or regulated component
 - Use risk to decide
- **Important Process Areas**
 - Risk management (involve all stakeholders)
 - Integrated Project Management (tailoring, involve stakeholders)
 - Integrated Teaming (skills, roles, organization)
 - Decision Analysis and Resolution (streamlined, simple techniques)

Tool to Select the Appropriate Process*



*from [Boehm, 2004]. Used with permission.

Questions to Ponder

- **How measure defects:**
 - **Old: Team peer review finished work product (change \Rightarrow defect)**
 - **New: Team reviews and fixes immediately (refactor)**
- **How measure progress?**
 - **Artifacts accumulate detail**
 - **Process activities continuously improve**
 - **Milestone content (process anchors)**
- **How estimate?**
 - **CAIV, SAIV, or Time Boxing**
 - **SouthernSCOPE (SCUD)**
- **How specify, procure, and sustain systems?**
 - **Contract law**
 - **Program management (milestones, work products)**
 - **Deliverables (Technical Data Package)**
 - **COTS refresh and obsolescence**

References

[Chrissis, 2003] “CMMI – Guidelines for Process Integration and Product Improvement”, Mary Beth Chrissis, Mike Conrad, and Sandy Shrum, Addison-Wesley, 2003, ISBN 0-321-15496-7

[Boehm, 2004] “Balancing Agility and Discipline: A Guide for the Perplexed”, Barry Boehm and Richard Turner, Addison-Wesley, 2004, ISBN 0-321-18612-5.

A web site with many links for agile methods is:

http://www.iturls.com/English/SoftwareEngineering/SE_Agile.asp

The web site for southernSCOPE is:

<http://www.mmv.vic.gov.au/southernscope>